6.1 INTRODUCTION

Across the world, education is a vital process in human development and also refine and preserve the collective values embedded in the culture of the society. It is a process of promoting the harmonious development of a person capable of exercising such responsibilities in the society as her powers allow and direct towards the merger of the individual self with her universal self as the final end. Education is a network of worthwhile knowledge, skills and habits where adequate knowledge for effective citizenship and collective benefits of society is achieved and passed on from one generation to the other. It is a cooperative teaching-learning process of preparing an individual from birth and all through his life for happy and useful living in the society within the culture and resources (Oyekan, 2000). It is a social service which ensures refinement of human behavior in terms of his processes of reasoning, feeling and doing things in a happy expectancy.

“Education is the most powerful weapon which you can use to change the world” (Nelson Mandela). The statement not only signifies the vital role of education but also the importance of schools or educational institutions. The purpose of schooling is the transmission of culture, the process by which the culture of a society is passed on to its children. Thus, education paves the path leading to disillusionment as it is a self-enlighten process. It wipes out the wrong beliefs; creates a clear picture of everything around us; and we no more remain in confusion about the things that we learn. Education brings up questions and also devises ways to find satisfactory answers that lead us to enlightenment. It is education that builds in every individual a confidence to take decisions, to face life, and to accept success & failures. It instills a sense of pride about the knowledge one has and prepares him for life as the true purpose of education is to bring about preparedness to one’s emotions, to broaden one’s perspectives and to
lead to a healthier approach of looking at life. As it is defined, it becomes quite clear that it is a form of cooperative teaching-learning process in which the knowledge, skills and habits of a group of people are transferred from one generation to the next through teaching and training.

In the era of tough competition students’ interaction with teachers play a key role in their academic success. It is only the knowledge, skills, and habits of students which decide their academic success. The greater expectation of parents from their children in subjects learning puts a lot of pressure on students and especially on teachers in general education system to use teaching and thinking style in accordance with the learning and thinking style of students and also act as a model in the classroom to develop their meta-cognitive skills. One of the current educational concerns is that of under achievement of students in scholastic area because of which they are not able to cope with the difficulties which they have to face. In this case their meta-cognitive skills and learning & thinking style play an important role to enhance their academic achievement and to improve their study habits. Meta-cognition involves students’ awareness and understanding of their learning skills, performance, preferences, barriers and goals. Meta-cognitive skills include taking conscious control of learning and selecting strategies, monitoring the progress of learning, correcting errors, analyzing the effectiveness of learning strategies and changing learning behaviors & strategies when necessary. It is fact that effective meta-cognitive skills and hemisphericity dominance of students for learning & thinking style affect their academic achievement and develop healthy and effective study habits among students to surpass the limits circumscribed by their intelligence, bringing them to the category of overachievers. Thus school, teachers and parents spend a lot of time and make efforts for helping students to achieve better position in the scholastic endeavor.

6.2 ACADEMIC ACHIEVEMENT

At present time, Indian Education has made its place in the eyes of the world. If we look into the past, India was known for its education system as well as for Indian philosophy. Earlier education was according to different strata of society but now with the
modernization and westernization, the entire concept of education has been changed. The concept of education has never been so important and central in the life of individuals, organizations and societies in the history of our civilization as it is observed in the contemporary times. Today’s societies are living, developing, thriving, competing and improving on the pivot of knowledge only. To satisfy the needs of students of the 21st century new experiments, creative innovations, and appropriate strategies are being developed and tried out to improve education at all levels. Now the sole focus is to accelerate the achievement or more appropriately the academic achievement of the learners.

The definition of academic achievement, however, varies among educators, policymakers and other educational stakeholders. It refers to the level of schooling the students have successfully completed and the ability to attain success in their studies. It generally indicates the learning outcomes of pupil according to which require a series of planned and organized experiences. Crow and Crow (1969) defined that “academic achievement as the extent to which a learner is profiting from instruction in a given area of learning i.e. achievement is reflected by the extent to which skill and knowledge has been imparted to him.” According to Good (1973), “Academic achievement is the knowledge, attitude or skill developed in the school subject usually designed by test scores or by marks assigned by teacher or by both.”

Good academic achievement tends to help both in improving the personality of the students and their recognition by parents, teachers, neighbors and society at large. It boosts their moral and develops feeling in them that they are useful in the family, school, and society. A well-educated person is known all over the region and able to meet the conflicting challenges and tide over all the difficulties which confront him in day to day living. In this way education develops the individual like a flower which distributes its fragrance all over the environment. According to Lewin, Wasanga and Somerset (2011), “The academic achievement of students at secondary school level is not only a pointer of the effectiveness of schools but also a major determinant of the welfare of youths in particular and the nation in general.”
6.3 STUDY HABITS

Study habits typically denote the degree to which students engage in regular acts of studying that are characterized by appropriate studying retains (review or material) occurring in an environment that is beneficial to studying. Study habits refer to the activities carried out by learners during the learning process for the improvement of learning. Study habits are learning tendencies that enable students to work privately and also intended to elicit and guide one’s own cognitive processes during learning. Narramore (1974) defined habit as “a pattern of activity which, through repetition, has been learned to the point that it has become automatic and can be carried on with a minimum of conscious effect.” Study habit is “The adopted way and manner a student plans his private reading after classroom learning so as to attain mastery of the subject. Good study habits are good asset to learners because study habits helps students to attain mastery in areas of specialization and ensuing excellent performance, while the opposite becomes constraint to learning and achievement leading to failure,” (Azikiwe, 1998). Effective study habit refers to a situation in which a learner studies regularly to achieve maximum success in his school work. Study habits, therefore refer to learning which leads to the achievement of a learner’s goal through a prescribed pattern of steady behaviour. Crede and Kuncel (2008) defined “study habit as study routines including but not restricted to frequency of studying sessions, review of material, self-testing, rehearsal of learned material, and studying in a conducive environment.”

For students, including children in elementary school, youngsters in secondary schools and adults in colleges or training program, learning from teachers and books becomes a dominant activity in their lives. They are expected to become professional learners and are rarely given any training in how to learn (Weinstein & Mayer, 1986 and Mayer, 1992). Study habits often remain a part of hidden curriculum in spite of their importance. Material that is not heavily taught in the classroom but student is expected to learn it. Successful students, somehow, acquire study strategies even though strategy instruction has not been incorporated into the curriculum on a large scale. To know when, why and where a particular study strategy will be used is a kind of meta-
cognitive skill that helps students to improve their study habits. “Successful students show a commitment to maximize learning from educational experiences, monitor their progress, and make adjustments in their efforts when necessary to accomplish their goals,” (Ainley, 2006; Ainley and Patrick, 2006; and Miller & Brickman, 2004).

Study habits of the students are affected by several factors i.e. ability, health, self-concept, motivation etc. Motivation is one of the most important components of learning in any educational environment (Miltiadou & Savenye, 2003). Student motivation is particularly important because it can be assessed and changed (Fortune, Mingun, and Cavazos 2005). Students with high level of motivation are very industrious with their school work. Student who has negative thoughts about himself/herself leads to negative result; on the other hand, students with positive thoughts try as much as they can to be very studious. It has been found that positive attitude, proper physical condition and balanced emotional states are important factors that influence study habits of students (Crow & Crow, 1969). According to Emeka (2000), “Intellectual endowment also plays a vital role in students’ study habits because students with low intellectual power cannot study effectively, but students endowed with high intellectual power, with little effort can study well.” Good health, sufficient sleep, appropriate exercise and nutritious diet are essential for better learning outcomes. A healthy student has a stronger drive to learn and work vigorously as compared to unhealthy students. Therefore, to enhance the learning outcomes of students, effective study habits must be developed among them.

Study habits of the students are probably very important predictor of high achievement. When students are proficient in how to study effectively, how to take notes at lectures, how to prepare for and take examinations, it is very likely that they will perform well in their academic work. Moreover, it is considered that unhealthy study habits become a hurdle in the way of achievement of the individual and do not let him to make the best use of his potentialities and dragged him down to poor performance in the academic domain. Unhealthy study habits among the students may be a possible and pertinent reason for their failure (Smith, 1961). He further described that what a student learns
depends upon his learning methods, the goal he sets, the time he spends, the degree to which he becomes actively involved in his work, the breath of the framework within which he tries to learn and the extent to which he applies what he learns. The ambitious and intelligent students are more likely to develop effective study habits and bring their own rewards in the sense of achievement of success. The formation of effective study habits creates the awareness for regular and steady learning. Hence, study habits of students’ play important role in learning and fundamental to school success.

6.4 META-COGNITIVE SKILLS

Meta-cognition refers to the actual monitoring and consequent regulation of the processes in relation to the cognition object or data on which they bear, usually in service of some concrete goals or objectives. Controlling thinking processes and becoming more aware of one’s own learning is called meta-cognition. “Meta-cognition is any kind of cognitive transaction with the human or non-human environment, where a variety of information processing activities go on,” (Flavell, 1979). In simple words, meta-cognition means ‘thinking about one’s own thinking.’ It refers to the knowledge of learners about their own cognition, cognitive functioning and possibly that of others. Wenden (1998) considered meta-cognitive knowledge as “a prerequisite for the self-regulation of learning. It involves planning, decisions taken at the outset of learning and the monitoring processes that regulate the completion of a learning task.” It is considered that these are general skills of planning, monitoring and evaluating through which learners manage, direct, regulate and guide their learning. Hartman (2001) claimed that with high levels of domain specific knowledge may facilitate the acquisition and use of meta-cognition in learning. Winne and Hadwin (1998) also defined “meta-cognition as the knowledge of one’s own cognitive & affective processes and the ability to consciously & deliberately monitor and regulate these processes.”

The chief aim of education is to prepare students to adapt efficiently to new situations and transfer their acquired procedural knowledge to solve novel problems. It
believed that if one only supplies his/her students rigorously with content and academic skills, meta-cognitive skills will emerge naturally as part and parcel of intellectual maturity. But the ability to examine oneself as a cognitive agent will develop naturally only to a pitiful rudimentary level. Meta-cognitive skills are the abilities which are used to understand and analyze one’s own learning especially influenced by educational background and previous experience. Meta-cognitive skills make one aware of one’s own knowledge, the ability to understand, control and manipulate one’s own cognitive process. In other words, we can say that meta-cognitive skills are the techniques that instill meta-cognition allow students a sense of control over their own learning, alleviate anxiety, enhance motivation, reduce incompetence and unwarranted confidence and hopefully generate life-long learners. Meta-cognitive skills refer to an individual’s awareness, evaluation and regulation of their own thinking activity. Brown, Bransford, Ferrara, and Campione (1983) showed that one of the key traits of good problem-solvers is highly developed meta-cognitive skills. They know how to recognize flaws or gaps in their own thinking, articulate their thinking processes, and revise their efforts.

When we start something new, orientation and planning play important role. Planning is related with learning plan, setting goals, and prioritizing materials instead of learning itself. Monitoring is related with monitoring of learning and strategies used in self-analysis and assessment of the effectiveness of the implementation of the strategy. During the task monitoring, testing, making a diagnosis and repairing are necessary skills. After the completion of learning task evaluation and reflection come into focus. In our everyday thinking, we actively engage in these skills i.e. planning, monitoring and evaluation. We decide what method to use or when to ask for help to solve a problem. We use meta-cognitive skills to help us decide which elements we understand and which we do not understand. In other words, students with strong meta-cognitive skills can control and manage their own thinking and also the outcome of their thinking process. These allow students to make flexible and efficient adjustment to new
situations, and transfer of procedural knowledge to novel settings. These skills help students to be sensitive to external constraints i.e. time, resources, help and internal obstacles i.e. level of expertise, motivation, effort required, affect etc. Understanding of different levels e.g., as demarcated by the abilities to summarize, criticize, analyze, synthesize, etc. is possible through meta-cognitive skills. These skills are also helpful to reduce well-embedded misconceptions that normally inhibit the acquisition of the academically accepted theories and explanations, and enhance motivation in gaining control of the learning process, and self-regulating problem solving.

6.5 LEARNING AND THINKING STYLE

The term ‘learning style’ refers to an individual’s natural, habitual and preferred way of absorbing, processing and retaining new information and skills (Reid, 1998). They are characterized as the way people acquire and understand new knowledge and skills. These are typical approaches or patterns i.e. visual, auditory and kinesthetic that gives direction to learning behavior (Cornett, 1983). Each learner has distinct and consistent preferred ways of perceptions, organization and retention. Every learner follows its own unique way to learn and process information. Some learn by oral repetition, some may learn by writing it out, while others may learn through practical work. Learning style can be described as a set of factors, behaviors and attitudes that facilitate learning for an individual in a given situation. Gregorc (1979) defines learning style as “distinctive behaviors which serve as indicators of how a person learns from and adapts to the environment. It also gives clues as to how a person’s mind operates.” The Dunn and Dunn Learning-Style Model focuses on understanding how individuals learn best and also defines learning styles as the way in which individuals begin to concentrate on, process, internalize, and retain new and difficult information (Dunn and Dunn, 1992). Liu (2008) defined it as “approaches to learning which refer to information processed in a preferred way in accordance to learner’s habitual characteristics.” Sarasin (2006) described learning style as “a certain specified pattern of behavior or performance according to which the individual approaches a learning experience.”
Learning styles are cognitive, affective and physiological traits and influenced by personality type, educational specialization, career choice and current job role and tasks (Kolb, Boyatzis, & Mainemelis, 2001). A good strategic learner must understand how to identify their learning goal, integrate the learning style, apply proper skills and be self-regulated to achieve the best results from learning (Paris & Wingrad, 1990; Zimmerman & Schunk, 2001; and Wardsworth et al., 2007). Learning problems are frequently not related to the difficulty of the subject matter but rather to the type and level of the cognitive processes required to learn the material (Keefe and Ferrell, 1990). Kolb and Kolb (2005) stated that there is no such thing as a fixed learning style; rather, learning occurs on a continuum ranging from concrete to abstract, or from reflective observation to active experimentation. A significant number of theorists and researchers have argued that learning styles are not determined by inherited characteristics but develop through experience. Styles are therefore not necessarily fixed, but can change overtime, even from one learning situation to the next. Some theorists, on the other hand are more interested in how learners tackle a specific learning task with their learning strategy than any habitual preference or style. That is why, it seems as an easier and more effective way to select and organize teaching methods & strategies and teaching material in the classroom environment according to learning styles rather than expecting the students to adapt to the existent organization. Accommodating teaching to learning styles improves students’ overall learning results, increases both motivation & efficiency and enables a positive attitude towards the subject being learned. Harmony between learning style and teaching style increased academic achievement and satisfaction with learning (Lindsay, 1999).

In accordance with the learning style of students, their thinking style also contributes a lot in their learning outcomes. But in today’s era, growing generation believes that machine is more powerful and better than a live thinking human being. The machine has acquired status, become a symbol of power and modernity with viable future. They are going to occupy increasing physical space and psychological space, particularly for the younger generation. But the fact is that computers will only do things that are told to
do. Human beings can do things which he has not been told to do because he can think frankly. Capacity to think is a human virtue that is valued from ancient times. This unbeatable human virtue is still relevant. Qatami (2001) defined that “thinking is considered a mental process in which the learner develops through mental interaction processes between the individual and the experiences that he acquires to develop structures of knowledge and access to new assumptions and expectations.” It includes making many mental and knowledge processes, such as attention, cognition, memory, classification, reasoning, analysis, comparing & generalizing and synthesis (Abu El-Maati, 2005).

A ‘thinking style’ is defined as an individual’s preference for a specific thinking process (Zang and Sternberg, 2006). Thinking styles have two dimensions: Cognitive and Affective. The cognitive dimension is related to the use of strategies for reasoning and problem solving acquired by experience. The affective dimension has to do with how the person’s interests and attitudes affect them (Zhang, Sternberg and Rayner, 2012). “Thinking style is the individual’s preferred way of thinking when doing business; and describes how the individual uses or exploits the capacities that he owns i.e. knowledge which is not an ability but it is located between the character and capacities,” (Sternberg, 2002). Thinking styles may be defined as the mental frameworks that enable individuals to process information and solve problems in specific contexts. It is not ability but rather a preferred way of using the abilities one has. Ability refers to how well one can do something. A style refers to how some one likes to do something. Styles help us to understand why some people succeed in their chosen careers and others don’t.

In classrooms, the process of teaching and learning mostly depends on remembrance of facts and figures in the order given in the text books. Few pupils with certain thinking preferences get advantage out of this and others are considered as dull. Those who are failed in the school examinations are viewed as stupid and lack the ability to succeed. But many of these students are not actually stupid or dull. In a changed teaching - learning atmosphere or in a different situation, they may perform well. Many of them
have the ability to succeed. Many of the others thought to be dump are not so at all but rather simply did not learn in a way that was compatible with the way teachers were teaching. What is seen as stupidity or intransigence may actually be nothing but a mismatch between the style of one individual and the style of another. What is attributed to ability is really in part a question of styles of thinking. Due to the mismatch in styles among the students and teachers, so many students derail from their preferred areas of studies. Students whose styles don’t match the expectations of their parents or teachers are derogated for wrong reasons. Countless students study something that they like well enough but that is not what they love, because they or others believe these students lack the ability to study what really interesting to them. Thus, it is necessary that schools take into account student’s style of thinking and consider the chances between the way of teaching a subject and the way the student thinks. The awareness of style of thinking is useful in perceiving the students as she/he is. Teachers should teach students how to think instead of teaching what to think.

“Styles depend upon cerebral dominance of an individual in retaining and processing different modes of information in his/her own style of learning and thinking. Style indicates the hemisphericity functions of the brain and students’ learning strategy and information processing are based on the preferences of the brain area,” (Venkataraman, 1994). Clemen and Lochhead (1979) argued that styles contribute to achievement beyond what can be expected by student’s intelligence. Brain hemisphericity is the tendency of an individual to process information through the left hemisphere or the right hemisphere or in combination (Bradshaw & Nettleton, 1981 and Springer & Deutsch, 1993). Iaccino (1993) and Torrance (1988) demonstrated that the left hemisphere operates in a linear, sequential manner with logical, analytical and propositional thought whereas right hemisphere operates in a nonlinear, simultaneous fashion and deals with non-verbal information as well as dreams and fantasy. The left hemisphere appears to be specialized for language, whereas the right hemisphere is specialized for visual-spatial and appositional thought. Kinsella (1995); and Oxford, Ehrman, and Lavine (1991) also examined that right-hemispheric dominants are highly global, visual, relational, and intuitive learners whereas left hemispheric dominants are
highly analytic, verbal, linear and logical learners. McCarthy (1996) observed that whole-brain dominants have flexible use of both hemispheres as they process information through both hemispheres equally and exhibit characteristics of both hemispheres. The difference in preference of hemispheres for information processing has been referred to as style of learning and thinking.

One of the most significant advances in education has come from a considerable amount of research done in the area of learning & thinking style which recognizes that the students in classrooms have variety of differences in their learning & thinking style. The styles of learning & thinking are as important as the levels of ability. Learning and thinking style is an ability of learners to perceive and process information in various learning situations. To teach and learn more effectively, instructors and learners need to better understand individual differences and also these individual differences how affect the learning process. Understanding individual learning & thinking style preferences has significant implications for learners as it helps them be aware of themselves, their abilities, how they learn, how they think and why they differ from peers. It has been determined that brain structure strongly influences language structure acquisition. It has also been found that different hemispheres of the brain contain different perceptions avenues.

Style of learning & thinking is cerebral dominance of an individual in retaining and processing modes of information. It identifies hemisphericity dominance by way of studying the hemisphere functions and indicates a student’s learning strategy and brain hemisphere preference in problem solving. Various studies have showed that students taught through methods that matched their hemispheric styles achieved statistically significant better test scores than when they were taught through other teaching methods (Brennan, 1984 and Jarsonbeck, 1984). Therefore, it is necessary for the teachers to know the students preferred styles, so that the teachers can capitalize the opportunities for students learning. Styles like abilities are not formed by birth, but are partly developed due to environmental condition. The choice of style depends on the person’s learning experience, the environment and abilities. He further suggested that if
the content of learning is in consistent with students’ preferred learning & thinking style, then their learning improves better than before. Teachers must eventually come forward to understand and identify the preferred style of learning and thinking in students and also assess the styles of students for developing intelligence and creativity in the fields of their preferred styles in academic areas.

6.6 RATIONALE OF THE STUDY

During the last few decades, there has been a radical change in every field on account of scientific inventions and technological advancement. In the field of education often we hear that one of the most important tasks of education is to teach students how to learn on their own throughout their lifetimes. In this process of teaching-learning teachers play an important role. It is foremost important for the teachers to focus their attention on students’ favourite learning and thinking style and develop their meta-cognitive skills before imparting the subject matter. If they fail to do so, the consequences may be serious, because the teachers may tend to confuse styles of students mind. Since the method of teaching adopted by teachers often reflects their personal thinking style, the students who have the same thinking style of the teachers are only benefited and rewarded. Measuring the achievements of students should not be enough as bases in evaluating how students got their course. There are so many factors which affect students’ academic achievement, but their meta-cognitive skills and learning & thinking style are great factors to look at their academic achievement. These factors of meta-cognitive skills and learning & thinking style) are usually the reasons that made the achievements low or high, study habits good or bad when these are not discovered and used to strengthen the learners’ level of learning.

Researchers like Alam (2001); Sahu & Sood (2005); Mittal (2008); Gakhar, (2008); Yala & Wanjoji (2011); Adodo and Oyeniyi (2013); Himghaempanah, Karimi, and Najafi (2014); Owo and Ikwut (2015); Panchu, Bahuleyan, and Seethalakshmi (2016); and Lee, Makara, Fishman & Teasley (2017) studied academic achievement in relation to socio-economic status, internet addiction learning & thinking style, learning
strategies, anxiety level and achievement motivation, mental health and locality, meta-cognitive regulation students’ perception of their teachers’ attitude towards them, teachers’ experience and educational qualifications at secondary level. The results indicated significant relationship between these variables and academic achievement. Thathong (2002); Deborah and Brian (2006); Young (2008); Nuthana and Yenagi (2009); Hassanbeigi et.al (2011); Kumar (2013); Chandra & Reddy (2014); Chris (2015); Sherafat & Murthy (2016); and Kanchan (2017) investigated study habits and other related variables at different levels. Adewole (2001); Xiao (2005); Cubukcu (2008); Kummin and Rahman (2010); Rani and Govil (2013); Kristian, Susilo, Rohman and Aloysius (2015); Aghayousefi, Yaghoobian and Arsanjani (2016); and Siswati & Corebima (2017) conducted studies on meta-cognitive skills and other variables at different levels. Steward (1979); Moore (1984); Diskowski (1991); Flores-Fist (1995); Hansen (2000); Wang, Hinn and Kanfer (2001); Gafoor (2008); Khalid, Mokhtar, Omar-Fauzee, Kasim, Don (2013); Bhakhshayesh (2014); Bhadawkar & Padmanabhan (2016); and Khan & Unnisa (2017) studied learning & thinking style separately and in combination with other variables at different levels.

Review of related literature revealed that various studies have been conducted in area of meta-cognitive skills at different levels. But the fact is that a very little amount of research has been carried out in Indian context related to meta-cognitive skills at secondary level as majority of researches have been conducted in abroad. Further, it was found that the variable learning and thinking style has been studied separately in most of the researches. There were very few studies on combined learning & thinking style. Therefore, it was identified that various studies were conducted on meta-cognitive skills and learning & thinking style including students, teachers and prospective teachers with respect to a number of variables. But no studies were conducted on academic achievement and study habits among school students in relation to their meta-cognitive skills, learning & thinking style. Thus, the lack of researches in the present area motivated the researcher to take up the present topic and
to study the effect of meta-cognitive skills and learning & thinking style on academic achievement and study habits of school students. This study would be relevant to policy makers and curriculum experts in the education sector that it will help to review our present educational policy and curriculum with the aim of introducing meta-cognitive skills and hemisphere preference for learning & thinking style as a core component of teaching-learning process to improve learning abilities of students. The findings of this study would be of immense benefit to the teachers, students and educational researchers to enhance assessment in planning, instruction and conducting classroom research in the educational sector.

6.7 STATEMENT OF THE PROBLEM

A STUDY OF ACADEMIC ACHIEVEMENT AND STUDY HABITS AMONG SCHOOL STUDENTS IN RELATION TO THEIR META-COGNITIVE SKILLS, LEARNING AND THINKING STYLE.

6.8 OPERATIONAL DEFINITIONS OF THE KEY TERMS USED

❖ Academic Achievement

Academic achievement is the knowledge attained or skills developed in the school subjects, usually designated by test scores or by marks assigned by teachers. It is the indication of performance or achievement in a test performed to measure one’s achievement. In the present study, academic achievement of the students was determined on the basis of their previous examination marks. For the purpose of the study, the investigator obtained 8th class board examination total marks of the students from their school records. Thus, the obtained marks of the students acted as the scores of dependent variable (academic achievement) in the study.

❖ Study Habits

Study habit is auto nominally, learned behavior pattern that enables the student to acquire how to study. Study habits typically denote degree to which students engages in regular acts of studying that are characterized by appropriate studying retains (review or material) occurring in an environment that is beneficial to
studying. Study habits are learning tendencies that enable students to work privately and also intended to elicit and guide one’s own cognitive processes during learning.

❖ **Meta-cognitive Skills**

Meta-cognitive skills are knowledge about one’s own learning process. The term also refers to an individual’s awareness, monitoring, evaluation and regulation of their own thinking activity. These skills are the abilities which are used to understand and analyze one’s own learning especially influenced by educational background and previous experiences.

❖ **Learning & Thinking Style**

Learning & Thinking Style is that which describes the variations among learners in using one or more senses to understand, organize and retain experience. It depend upon cerebral dominance of an individual in retaining and processing different modes of information in his own style of learning & thinking. Brain hemisphericity is the tendency of an individual to process information through the right hemisphere or the left hemisphere or in combination. Right-hemispheric dominants are highly global, visual, relational, and intuitive learners, whereas left hemispheric dominants are highly analytic, verbal, linear and logical learners. Whole-brain dominants have flexible use of both hemispheres as they process information through both hemispheres equally and exhibit characteristics of both hemispheres.

6.9 VARIABLES INVOLVED

1. **Dependent Variables**
   ❖ Academic Achievement
   ❖ Study Habits

2. **Independent Variables**
   ❖ Meta-cognitive Skills
     ❖ High Meta-cognitive Skills
     ❖ Low Meta-cognitive Skills
   ❖ Learning & Thinking Style
     ❖ Right Hemisphericity
6.10 OBJECTIVES OF THE STUDY

A. Objectives related to Academic Achievement of School Students with respect to their Meta-cognitive Skills, Locality and Gender

1) To study the effect of (a) meta-cognitive skills, (b) locality, and (c) gender on academic achievement of school students.

2) To study the interaction effect of (a) meta-cognitive skills and locality; (b) meta-cognitive skills and gender; and (c) locality and gender on academic achievement of school students.

3) To find out the interaction effect of meta-cognitive skills, locality and gender on academic achievement of school students.

B) Objectives related to Academic Achievement of School Students with respect to their Learning & Thinking Style, Locality and Gender

4) To study the effect of (a) learning & thinking style, (b) locality, and (c) gender on academic achievement of school students.

5) To study the interaction effect of (a) learning & thinking style and locality; (b) learning & thinking style and gender; and (c) locality and gender on academic achievement of school students.

6) To find out the interaction effect of learning & thinking style, locality and gender on academic achievement of school students.

C. Objectives related to Study Habits of School Students with respect to their Meta-cognitive Skills, Locality and Gender

7) To study the effect of (a) meta-cognitive skills, (b) locality, and (c) gender on study habits of school students.
8) To study the interaction effect of (a) meta-cognitive skills and locality; (b) meta-cognitive skills and gender; and (c) locality and gender on study habits of school students.

9) To find out the interaction effect of meta-cognitive skills, locality and gender on study habits of school students.

D. Objectives related to Study Habits of School Students with respect to their Learning & Thinking Style, Locality and Gender

10) To study the effect of (a) learning & thinking style, (b) locality, and (c) gender on study habits of school students.

11) To study the interaction effect of (a) learning & thinking style and locality; (b) learning & thinking style and gender; and (c) locality and gender on study habits of school students.

12) To find out the interaction effect of learning & thinking style, locality and gender on study habits of school students.

E. Objectives related to Prediction of Academic Achievement and Study Habits among School Students on the basis of their Meta-cognitive Skills and Learning & Thinking Style

13) To predict academic achievement among school students on the basis of their meta-cognitive skills and learning & thinking style.

14) To predict study habits among school students on the basis of their meta-cognitive skills and learning & thinking style.

6.11 HYPOTHESES OF THE STUDY

A. Hypotheses related to Academic Achievement of School Students with respect to their Meta-cognitive Skills, Locality and Gender

H_{01} There exists no significant effect of (a) meta-cognitive skills, (b) locality, and (c) gender on academic achievement of school students.

H_{02} There exists no significant interaction effect of (a) meta-cognitive skills and locality; (b) meta-cognitive skills and gender; and (c) locality and gender on academic achievement of school students.

H_{03} There exists no significant interaction effect of meta-cognitive skills, locality and gender on academic achievement of school students.
B. Hypotheses related to Academic Achievement of School Students with respect to their Learning & Thinking Style, Locality and Gender

H04 There exists no significant effect of (a) learning & thinking style, (b) locality, and (c) gender on academic achievement of school students.

H05 There exists no significant interaction effect of (a) learning & thinking style and locality; (b) learning & thinking style and gender; and (c) locality and gender on academic achievement of school students.

H06 There exists no significant interaction effect of learning & thinking style, locality and gender on academic achievement of school students.

C. Hypotheses related to Study Habits of School Students with respect to their Meta-cognitive Skills, Locality and Gender

H07 There exists no significant effect of (a) meta-cognitive skills, (b) locality, and (c) gender on study habits of school students.

H08 There exists no significant interaction effect of (a) meta-cognitive skills and locality; (b) meta-cognitive skills and gender; and (c) locality and gender on study habits of school students.

H09 There exists no significant interaction effect of meta-cognitive skills, locality and gender on study habits of school students.

D. Hypotheses related to Study Habits of School Students with respect to their Learning & Thinking Style, Locality and Gender

H010 There exists no significant effect of (a) learning & thinking style, (b) locality, and (c) gender on study habits of school students.

H011 There exists no significant interaction effect of (a) learning & thinking style and locality; (b) learning & thinking style and gender; and (c) locality and gender on study habits of school students.

H012 There exists no significant interaction effect of learning & thinking style, locality, and gender on study habits of school students.

6.12 DELIMITATIONS OF THE STUDY

Due to paucity of time & resources and to make it more meaningful, the present study is delimited in the following aspects:

1) The present investigation is confined to school students at secondary level only.
2) The study is delimited to the students studying in 9th class only.
3) The study is restricted to private schools affiliated to Central Board of Secondary Education (CBSE) only.
4) The present study is delimited to two districts (Jind & Rohtak) of Haryana state only.

6.13 CHAPTERISATION SCHEME
The present study has been divided into six chapters. Out of the six Chapters, Chapter I is Introduction which includes Need of the Study, Variables Involved, Objectives, Hypotheses and Delimitations of the Study. The Chapter II is devoted to the Review of Related Literature. In chapter III, Design of the Study, Sample, Tools, Procedure and Statistical Techniques have been presented. The Chapter IV deals with the Analysis and Interpretation of the Data along with the Discussion of the Results. In Chapter V, the Main Findings, Educational Implications of the Study and Suggestions for Further Research have been presented. The Chapter VI is allocated to the Summary of the present study.

6.14 DESIGN OF THE STUDY
In the present study, descriptive survey method was used. The study was carried out in four phases which have been discussed below:

I Main Effect Phase: In this phase the main effects of meta-cognitive skills, learning & thinking style, locality and gender were studied separately. In this study, the independent variables (meta-cognitive skills, learning & thinking style, locality and gender) were varied at two levels as shown below:
**II Double Interaction Phase:** In this phase, an attempt was made to find out the interaction effect of (a) meta-cognitive skills and locality; (b) meta-cognitive skills and gender; (c) locality and gender; (d) learning & thinking style and locality (e) learning & thinking style and gender on academic achievement and study habits of school students. The subjects were given different designations, and groups were formed to find out the interaction effects which are shown below as:

- **Interaction Effect of Meta-cognitive Skills and Locality (A×C) on Academic Achievement & Study Habits**
  - **A1C1:** Students with High Meta-cognitive Skills + Urban Students
  - **A2C1:** Students with Low Meta-cognitive Skills + Urban Students
  - **A1C2:** Students with High Meta-cognitive Skills + Rural Students
  - **A2C2:** Students with Low Meta-cognitive Skills + Rural Students

- **Interaction Effect of Meta-cognitive Skills and Gender (A×D) on Academic Achievement & Study Habits**
  - **A1D1:** Students with High Meta-cognitive Skills + Male Students
  - **A2D1:** Students with Low Meta-cognitive Skills + Male Students
  - **A1D2:** Students with High Meta-cognitive Skills + Female Students
  - **A2D2:** Students with Low Meta-cognitive Skills + Female Students
Interaction Effect of Locality and Gender (C×D) on Academic Achievement & Study Habits

- C1D1: Urban + Male Students
- C2D1: Rural + Male Students
- C1D2: Urban + Female Students
- C2D2: Rural + Female Students

Interaction Effect of Learning & Thinking Style and Locality (B×C) on Academic Achievement & Study Habits

- B1C1: Students with Right Hemisphericity + Urban Students
- B2C1: Students with Left Hemisphericity + Urban Students
- B1C2: Students with Right Hemisphericity + Rural Students
- B2C2: Students with Left Hemisphericity + Rural Students

Interaction Effect of Learning & Thinking Style and Gender (B×D) on Academic Achievement & Study Habits

- B1D1: Students with Right Hemisphericity + Male Students
- B2D1: Students with Left Hemisphericity + Male Students
- B1D2: Students with Right Hemisphericity + Female Students
- B2D2: Students with Left Hemisphericity + Female Students

### III Triple Interaction Phase:
A combined interaction effect of all the independent variables i.e. meta-cognitive skills, learning & thinking style, locality and gender on academic achievement and study habits of school students was explored separately. To find out the interaction effects, the subjects were given different designations, and groups were formed.
Interaction Effect of Meta-cognitive Skills, Locality and Gender (A×C×D) on Academic Achievement & Study Habits

A₁C₁D₁: Students with High Meta-cognitive Skills + Urban + Male
A₂C₂D₂: Students with Low Meta-cognitive Skills + Rural + Female
A₁C₁D₂: Students with High Meta-cognitive Skills + Urban + Female
A₂C₂D₁: Students with Low Meta-cognitive Skills + Rural + Male
A₁C₂D₁: Students with High Meta-cognitive Skills + Rural + Male
A₂C₁D₁: Students with Low Meta-cognitive Skills + Urban + Male
A₁C₂D₂: Students with High Meta-cognitive Skills + Rural + Female
A₂C₁D₂: Students with Low Meta-cognitive Skills + Urban + Female

Interaction Effect of Learning & Thinking Style, Locality and Gender (B×C×D) on Academic Achievement & Study Habits

B₁C₁D₁: Students with Right Hemisphericity + Urban + Male
B₂C₂D₂: Students with Left Hemisphericity + Rural + Female
B₁C₁D₂: Students with Right Hemisphericity + Urban + Female
B₂C₂D₁: Students with Left Hemisphericity + Rural + Male
B₁C₂D₁: Students with Right Hemisphericity + Rural + Male
B₂C₁D₁: Students with Left Hemisphericity + Urban + Male
B₁C₂D₂: Students with Right Hemisphericity + Rural + Female
B₂C₁D₂: Students with Left Hemisphericity + Urban + Female

IV. Prediction Phase: In this phase, prediction of academic achievement and study habits of school students was made on the basis of their meta-cognitive skills and learning & thinking style.

6.15 POPULATION
A population is a collection of people, items, or events about which the researchers want to make inferences. It is not always convenient or possible to examine every member of an entire population; therefore, an investigation is often restricted to one or more samples drawn from it. Secondary schools students studying in private schools
affiliated to Central Board of Secondary Education (CBSE) in Haryana constituted the target population for the present study.

6.16 Sample
Measuring the entire population becomes impracticable for the researcher. Therefore, a sample from the concerned population may be drawn for the purpose of data collection. In the present study, a sample of 500 secondary school students of 9th class studying in private schools affiliated to CBSE in Haryana state was selected through multi-stage random sampling technique. Haryana is divided into four divisions i.e. Ambala, Gurugram, Hisar and Rohtak for administrative purpose. Initially, out of these four divisions, Rohtak and Hisar division were chosen randomly by using lottery method. At the second stage, Rohtak district among the five districts (Rohtak, Jhajjar, Karnal, Panipat, & Sonipat) of Rohtak division; and Jind district among six districts (Hisar, Bhiwani, Fatehabad, Jind, Sirsa & Charkhi Dadri) of Hisar division were randomly selected. From each of these districts (Jind & Rohtak) the list of schools prepared by the Directorate of Education was procured which is available online. Thereafter, fourteen schools (8 schools from urban area and 6 schools from rural area) were selected randomly. Lastly, 30-45 students studying in 9th class from each school were also taken randomly. In this way, 500 secondary school students studying in 9th class constituted the final sample for the present study. School wise distribution of the sample has been shown in the Table-6.16.1

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of the School</th>
<th>Locality</th>
<th>Male</th>
<th>Female</th>
<th>Total Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Shiv Senior Secondary School, Gatauli, Jind</td>
<td>Rural</td>
<td>22</td>
<td>17</td>
<td>39</td>
</tr>
<tr>
<td>2.</td>
<td>J. B. M. Public School, Julana, Jind</td>
<td>Rural</td>
<td>19</td>
<td>22</td>
<td>41</td>
</tr>
<tr>
<td>3.</td>
<td>Vardey Devi Cosmo Public School, Brahmanwas, Julana, Jind</td>
<td>Rural</td>
<td>24</td>
<td>18</td>
<td>42</td>
</tr>
<tr>
<td>4.</td>
<td>Indus Public School, Jind</td>
<td>Urban</td>
<td>19</td>
<td>12</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>School Name</td>
<td>Location</td>
<td>No. of Boys</td>
<td>No. of Girls</td>
<td>Total</td>
</tr>
<tr>
<td>---</td>
<td>-------------------------------------------------</td>
<td>----------</td>
<td>-------------</td>
<td>--------------</td>
<td>-------</td>
</tr>
<tr>
<td>5</td>
<td>S. D. Senior Secondary School, Jind</td>
<td>Urban</td>
<td>17</td>
<td>16</td>
<td>33</td>
</tr>
<tr>
<td>6</td>
<td>Motilal Nehru Public School, Urban Estate, Jind</td>
<td>Urban</td>
<td>24</td>
<td>11</td>
<td>35</td>
</tr>
<tr>
<td>7</td>
<td>Maharishi Vidya Mandir Sr.Sec. School, Jind</td>
<td>Urban</td>
<td>21</td>
<td>13</td>
<td>34</td>
</tr>
<tr>
<td>8</td>
<td>Swami Nityanand Public School, Brahmanvas, Rohtak</td>
<td>Rural</td>
<td>18</td>
<td>13</td>
<td>31</td>
</tr>
<tr>
<td>9</td>
<td>Jyoti Prakash International School, Jasia, Rohtak</td>
<td>Rural</td>
<td>21</td>
<td>16</td>
<td>37</td>
</tr>
<tr>
<td>10</td>
<td>Duhan Public School, Jasia, Rohtak</td>
<td>Rural</td>
<td>15</td>
<td>14</td>
<td>29</td>
</tr>
<tr>
<td>11</td>
<td>Jyoti Prakash Sr. Sec. School, Rohtak</td>
<td>Urban</td>
<td>25</td>
<td>18</td>
<td>43</td>
</tr>
<tr>
<td>12</td>
<td>Mahindra Model Sr. Sec. School, Rohtak</td>
<td>Urban</td>
<td>21</td>
<td>14</td>
<td>35</td>
</tr>
<tr>
<td>13</td>
<td>Pathania Public School, Rohtak</td>
<td>Urban</td>
<td>19</td>
<td>13</td>
<td>32</td>
</tr>
<tr>
<td>14</td>
<td>Harkishan Public School, Rohtak</td>
<td>Urban</td>
<td>22</td>
<td>16</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>500</strong></td>
</tr>
</tbody>
</table>

The sample was further classified on the basis of their meta-cognitive skills, locality and gender. As per the norms given in manual 165 students who scored 183 and above on meta-cognitive skills scale were categorized as students with high level of meta-cognitive skills and 147 students who obtained scores 118 and below were treated as the students with low level of meta-cognitive skills. Hence, a total sample of 312 secondary school students was considered for analyzing the data as 188 students having average meta-cognitive skills were not considered in the study. As per the requirement of the $2 \times 2 \times 2$ cells of the paradigm, distribution of cells for analysis of interaction effect of meta-cognitive skills, locality and gender on academic achievement & study habits of school students has also been illustrated in the Fig. 6.16.1
In case of learning & thinking style, the hemisphericity dominance was determined on the basis of the highest score in three categories (Right, Left & Integrated Hemisphericity) of dominance, as far as a group testing or score is concerned. In the present study, only those students were selected who were having only right and left hemisphericity. The strength of right hemisphere preferred students was 256 and the strength of left hemisphere preferred students was 221. Therefore, a sample of 477 students was considered for computing the data as 23 students having integrated hemisphericity were not considered in the study. In this way as per the requirement of the 2×2×2 cells of the paradigm, distribution of cells for analysis of interaction effect of learning & thinking style, locality and gender on academic achievement & study habits of school students has also been illustrated in the Fig. 6.16.2.
6.17 TOOLS USED

The following tools were used by the investigators for the purpose of collecting data related to different variables covered in the present study:

C. STANDARDIZED TOOLS
   1) Study Habits Inventory by Palsane and Sharma (PSSHI) (2006)
   2) Style of Learning and Thinking (SOLAT by Venkataraman (2011)

D. SELF DEVELOPED TOOL

6.18 PROCEDURE OF DATA COLLECTION

Data collection is the process of gathering and measuring information on variables of interest, in an established and systematic manner that enables one to answer stated
research questions, test hypotheses and evaluate outcomes. The data collection component of research is common to all fields of study including physical and social sciences, humanities, business, etc. While methods vary by discipline, the emphasis on ensuring accurate and honest collection remains the same because accurate data collection is essential to maintaining the integrity of research.

After selection of the sample, principals of concerned schools were contacted by the researcher. After getting consent and approval from the principals, the investigator contacted the staff of different schools & explained them the purpose of the investigation and requested for their cooperation in this work. Subsequently, the investigator discussed in detail about the investigation with heads and staff of the respective schools and sought the permission from them for collecting the necessary data and the subjects. After permission, the students were contacted in order to establish the rapport with them. However, before administration of the test, the purpose of the data collection was told to the students and conducive environment was provided by the investigator. All the tools were administered one by one to the subjects. The instructions given in each tool were explained to the subjects in a specified manner. In order to giving responses to the questions free and frankly, honestly and sincerely, they made aware that there is no right or wrong answers to these questions. They were given full assurance by the investigator that information collected from them would be kept confidential. While administering all tests, the time limit was strictly followed as per the instructions given by the authors. The investigator gave her sincere attention via supervision for the time while administering the tests. An interval of 10-12 minutes was given to the students between two tests. After completion, questionnaires were collected and scored according to the instructions given in the concerned manual. For measuring academic achievement, the percentage of marks obtained by students in the eighth class was collected from school records.

6.19 STATISTICAL TECHNIQUES USED

Keeping in mind the nature of the study and the nature of objectives, statistical techniques were employed on the raw scores to make it meaningful and to test the significance of the scores. Without use of statistical techniques, raw scores do not have
their own denotation and connotation. In order to study the main effects and interaction effects of meta-cognitive skills, learning & thinking style, locality and gender on academic achievement and study habits, Three-Way Analysis of Variance (ANOVA) with $2 \times 2 \times 2$ Factorial Design was computed using SPSS version 20.0. Wherever F-value was found to be significant, then ‘t’-test was applied for further investigation. The Levene’s Test of Equality of Error Variance was also used to test the assumption of homogeneity of variance before applying Three-Way ANOVA. Stepwise multiple regression was used to predict the dependent variables (academic achievement and study habits) on the basis of independent variables (meta-cognitive skills and learning & thinking style). On the basis of these tools, procedures and statistical techniques employed, the analysis of data, interpretation and discussion of results have been presented in the forthcoming chapter.

6.20 MAJOR FINDINGS OF THE STUDY

On the basis of analysis and interpretation of data in the previous chapter, the following findings have been drawn out:

6.20.1 FINDINGS RELATED TO EFFECT OF META-COGNITIVE SKILLS, LOCALITY AND GENDER ON ACADEMIC ACHIEVEMENT OF SCHOOL STUDENTS

A. Main Effects of Meta-cognitive Skills, Locality and Gender on Academic Achievement of School Students

❖ The study revealed that there was a significant effect of meta-cognitive skills on academic achievement of school students. In the context of mean scores, it was found that students with high meta-cognitive skills had significantly higher academic achievement in comparison to students with low meta-cognitive skills.

❖ It was inferred that locality had a significant effect on academic achievement of school students. On comparison of mean scores, it was concluded that urban students had significantly better academic achievement than that of rural students.
Gender was found to have a significant effect on academic achievement of school students. It was revealed that female students had slightly higher academic achievement than that of male students.

B. Double Interaction Effects of Meta-cognitive Skills, Locality and Gender on Academic Achievement of school students

Meta-cognitive Skills (A) × Locality (C)
There was found a significant interaction effect of meta-cognitive skills and locality on academic achievement of school students. The result of t-test further revealed that:

- A significant difference was found between academic achievement of urban students with high meta-cognitive skills and urban students with low meta-cognitive skills. It was inferred that urban students with high meta-cognitive skills had significantly higher academic achievement as compared to urban students with low meta-cognitive skills.

- It was revealed that there was no significant difference between academic achievement of rural students with high and low meta-cognitive skills.

- A significant difference was found between academic achievement of urban students with high meta-cognitive skills and rural students with low meta-cognitive skills. From the comparison of mean scores, it was revealed that urban students with high meta-cognitive skills possessed significantly better academic achievement than rural students with low meta-cognitive skills.

- By comparing mean scores, it was concluded that there was no significant difference in academic achievement of rural students with high meta-cognitive skills and urban students with low meta-cognitive skills.

- It was found that mean academic achievement score of urban students with high meta-cognitive skills was higher than the mean academic achievement scores of rural students with high meta-cognitive skills. From the results, it was concluded that urban students with high meta-cognitive skills had significantly higher academic achievement than rural students with high meta-cognitive skills.
There was no significant difference found between the academic achievement of urban students with low meta-cognitive skills and rural students with low meta-cognitive skills.

**Meta-cognitive Skills (A) × Gender (D)**

It was revealed that there was no significant interaction effect of meta-cognitive skills and gender on academic achievement of school students.

**Locality (A) × Gender (B)**

There was found a significant interaction effect of locality and gender on academic achievement of school students. The result of t-test further revealed that:

- It can be concluded from the results that there was significant difference between academic achievement of urban male students and rural male students. Further, it was found out that urban male students had significantly better academic achievement as compared to rural male students.

- No significant difference was found between academic achievement of urban female students and rural female students.

- There was no significant difference found between academic achievement of urban male students and rural female students.

- On comparison of mean scores, it was concluded that urban female students had significantly higher academic achievement than rural male students.

- There was no significant difference found between the academic achievement of urban male students and urban female students.

- There was found a significant difference between the mean academic achievement scores of rural male students and rural female students. The mean academic achievements score of rural male students was lower than the rural female students. From the results, it was concluded that rural male students performed academically poor than rural female students.

(C) **Triple Interaction Effect of Meta-cognitive Skills, Locality and Gender on Academic Achievement of School students**
It was found that there was significant interaction effect of meta-cognitive skills, locality and gender on academic achievement of school students. For further exploration t-test was applied. The following conclusions were drawn:

- It was concluded from the results that there was no significant difference between academic achievement of urban male students with high meta-cognitive skills and rural female students with low meta-cognitive skills.

- It was further concluded that urban female students with high meta-cognitive skills had significantly higher academic achievement than rural male students with low meta-cognitive skills.

- No significant difference was found between academic achievement of rural female students with high meta-cognitive skills and urban male students with low meta-cognitive skills.

- There was no significant difference between academic achievement of rural male students with high meta-cognitive skills and urban female students with low meta-cognitive skills.

- From the results, it was inferred that there was no significant difference between academic achievement of urban male students with high meta-cognitive skills and urban female students with high meta-cognitive skills.

- It was revealed that there was significant difference between academic achievement of urban male students with high meta-cognitive skills and rural male students with high meta-cognitive skills. Urban male students with high meta-cognitive skills had significantly higher academic achievement as compared to rural male students with high meta-cognitive skills.

- There was no significant difference between academic achievement of urban male students with high meta-cognitive skills and rural female students with high meta-cognitive skills.

- It was concluded that urban female students with high meta-cognitive skills had significantly higher academic achievement than rural male students with high meta-cognitive skills.
The results of the study further revealed that there was no significant difference between academic achievement of urban female students with high meta-cognitive skills and rural female students with high meta-cognitive skills.

There was significant difference found between academic achievement of rural female students with low meta-cognitive skills and rural male students with low meta-cognitive skills. It was inferred that rural female students with low meta-cognitive skills had significantly better academic achievement than rural male students with low meta-cognitive skills.

A significant difference was found between academic achievement of rural female students with low meta-cognitive skills and urban female students with low meta-cognitive skills.

The results of the study revealed that there was no significance difference between academic achievement of rural female students with low meta-cognitive skills and urban male students with low meta-cognitive skills.

It was inferred from the results of the study that there was no significant difference between academic achievement of rural male students with low meta-cognitive skills and urban female students with low meta-cognitive skills.

It was concluded that rural male students with low meta-cognitive skills had significantly lower academic achievement than urban male students with low meta-cognitive skills.

There was no significant difference found between academic achievement of urban male students with high meta-cognitive skills and urban male students with low meta-cognitive skills.

It was found from the results of the study that urban male students with high meta-cognitive skills had significantly higher academic achievement than urban female students with low meta-cognitive skills.
It was inferred from the results of the study that there was significant difference between academic achievement of urban male students with high meta-cognitive skills and rural male students with low meta-cognitive skills.

The study revealed that urban female students with high meta-cognitive skills had significantly higher academic achievement than urban male students with low meta-cognitive skills.

Urban female students with high meta-cognitive skills had significantly higher academic achievement than urban female students with low meta-cognitive skills.

It was found that there was no significant difference between academic achievement of urban female students with high meta-cognitive skills and rural female students with low meta-cognitive skills.

The study revealed that rural male students with high meta-cognitive skills had significantly lower academic achievement than rural female students with high meta-cognitive skills.

It was inferred from the results of the study that rural male students with high meta-cognitive skills had significantly lower academic achievement than urban male students with low meta-cognitive skills.

In the context of mean scores, it was found that there was no significant difference between academic achievement of rural male students with high meta-cognitive skills and rural male students with low meta-cognitive skills.

It was found that academic achievement of rural male students with high meta-cognitive skills and rural female students with low meta-cognitive skills differed significantly.

The study further revealed there was no significant difference between academic achievement of rural female students with high meta-cognitive skills and urban female students with low meta-cognitive skills.
It was reported that rural female students with high meta-cognitive skills had significantly better academic achievement than rural male students with low meta-cognitive skills.

It was indicated that there was no significant difference between academic achievement of rural female students with high meta-cognitive skills and rural female students with low meta-cognitive skills.

No significant difference was found between academic achievement of urban male students with low meta-cognitive skills and urban female students with low meta-cognitive skills.

6.20.2 FINDINGS RELATED TO EFFECT OF LEARNING & THINKING STYLE, LOCALITY AND GENDER ON ACADEMIC ACHIEVEMENT OF SCHOOL STUDENTS

A. Main Effects of Learning & Thinking Style, Locality and Gender on Academic Achievement of School students

There was found a significant effect of learning & thinking style on academic achievement of school students. From the mean scores, it was inferred that students learned by left hemisphere had slightly higher academic achievement in comparison to students learned by right hemisphere.

It was found that locality had a significant effect on academic achievement of school students. In terms of mean scores, it was interpreted that urban students had significantly higher academic achievement in comparison to rural students.

The study revealed that there was a significant effect of gender on academic achievement of school students. Further it was showed that female students had significantly good academic achievement than that of male students.

B. Double Interaction Effects of Learning & Thinking Style, Locality and Gender on Academic Achievement of School students

Learning & Thinking Style (B) × Locality (C)
There was found a significant interaction effect of learning & thinking style and locality on academic achievement of school students. The result of t-test further revealed that:
It was concluded from the results that there was no significant difference between academic achievement of urban students with right and left hemisphericity.

On comparison of mean scores, it was revealed that rural students with right hemisphericity had significantly lower academic achievement than rural students with left hemisphericity.

There existed a significant difference between academic achievement of urban students with right hemisphericity and rural students left hemisphericity. Urban students with right hemisphericity had slightly higher academic achievement than rural students left hemisphericity.

A significant difference was observed between academic achievement of rural students with right hemisphericity and urban students with left hemisphericity. Rural students with right hemisphericity had significantly lower academic achievement than urban students with left hemisphericity.

It was revealed that urban students with right hemisphericity had significantly higher academic achievement than rural students with right hemisphericity.

From the results of the study it was inferred that there was significant difference between academic achievement of urban students with left hemisphericity and rural students with left hemisphericity. Urban students with left hemisphericity had significantly higher academic achievement than the academic achievement of rural students with left hemisphericity.

**Learning & Thinking Style (B) × Gender (D)**

It was inferred that there was significant interaction effect of learning & thinking style and gender on academic achievement of school students. The result of t-test further inferred that:

The results of the study revealed that there was no significant difference between academic achievement of male students with right and left hemisphericity.
On comparison of mean scores, it was found that female students with right hemisphericity had significantly lower academic achievement than female students with left hemisphericity.

A significant difference was found between the mean academic achievement scores of male students with right hemisphericity and female students left hemisphericity. On the comparison of mean scores, it was inferred that former had significantly lower academic achievement than that of the later one.

No significant difference was observed between academic achievement of female students with right hemisphericity and male students with left hemisphericity.

There was no significant difference between academic achievement of male students with right hemisphericity and female students with right hemisphericity.

It was concluded that there was a significant difference in academic achievement of male and female students with left hemisphericity. In the context of mean scores, it was further revealed that later had significantly better academic achievement than that of the former one.

**Locality (C) × Gender (D)**

It was indicated that there was no significant interaction effect of locality and gender on academic achievement of school students.

**C. Triple Interaction Effect of Interaction Effect of Learning & Thinking Style, Locality and Gender on Academic Achievement of School students**

It was palpable from the results of the study that learning & thinking style, locality, and gender differed significantly with each other in relation to academic achievement. The result of t-test further revealed that:

- From the results of the study, it was found that there was significant difference in the mean academic achievement scores of urban male students with right hemisphericity and rural female students with left hemisphericity.
- A significant difference was found between academic achievement of urban female students with right hemisphericity and rural male students with left hemisphericity.
Urban female students with right hemisphericity had significantly higher academic achievement than rural male students with left hemisphericity.

- On comparison of mean scores, it was revealed that rural female students with right hemisphericity possessed significantly lower academic achievement as compared to urban male students with left hemisphericity.

- It was concluded that there was a significant difference in academic achievement of rural male students with right hemisphericity and urban female students with left hemisphericity. In the context of mean scores, it was further revealed that the former had significantly poor academic achievement than that of the later one.

- There was no significant difference found between academic achievement of urban male students with right hemisphericity and urban female students with right hemisphericity.

- No significant difference was found between academic achievement of urban male students with right hemisphericity and rural male students with right hemisphericity.

- From the mean scores, it was revealed that urban male students with right hemisphericity had significantly better academic achievement than the rural female students with right hemisphericity.

- It was concluded that urban female students with right hemisphericity had significantly higher academic achievement than the rural male students with right hemisphericity.

- A significant difference was found between academic achievement of urban female students with right hemisphericity and rural female students with right hemisphericity. It was concluded that urban female students with right hemisphericity had significantly higher academic achievement as compared to rural female students with right hemisphericity.

- There was significant difference between academic achievement of rural female students with left hemisphericity and rural male students with left hemisphericity. From the comparison of mean scores, it was concluded that rural female students...
with left hemisphericity had significantly higher academic achievement than that of rural male students with left hemisphericity.

- No significant difference was found between academic achievement of rural female students with left hemisphericity and urban female students with left hemisphericity.

- It was observed that there was significant difference between academic achievement of rural female students with left hemisphericity and urban male students with left hemisphericity.

- A significant difference was found between academic achievement of rural male students with left hemisphericity and urban female students with left hemisphericity. In the context of mean scores, it was further revealed that the former had significantly poor academic achievement than that of the later one.

- There existed significant difference between academic achievement of rural male students with left hemisphericity and urban male students with left hemisphericity. From the mean scores, it was concluded that rural male students with left hemisphericity had significantly lower academic achievement than that of urban male students with left hemisphericity.

- It was revealed that there was no significant difference between academic achievement of urban male students with right hemisphericity and urban male students with left hemisphericity.

- There was no significant difference between academic achievement of urban male students with right hemisphericity and urban female students with left hemisphericity.

- It was concluded that there was significant difference between academic achievement of urban male students with right hemisphericity and rural male students with left hemisphericity. It was further concluded from the comparison of mean scores that urban male students with right hemisphericity had significantly better academic achievement as compared to rural male students with left hemisphericity.
There was no significant difference between academic achievement of urban female students with right hemisphericity and urban male students with left hemisphericity.

It was revealed that there was no significant difference between academic achievement of urban female students with right hemisphericity and urban female students with left hemisphericity.

No significant difference was found between academic achievement of urban female students with right hemisphericity and rural female students with left hemisphericity.

On comparison of mean scores, it was concluded that rural male students with right hemisphericity had significantly higher academic achievement than that of the rural female students with right hemisphericity.

It was found that there was no significant difference between academic achievement of rural male students with right hemisphericity and urban male students with left hemisphericity.

It was revealed that there was no significant difference between academic achievement of urban male students with right hemisphericity and rural male students with left hemisphericity.

It was observed that there was significant difference between academic achievement of rural male students with right hemisphericity and rural female students with left hemisphericity. It was deduced from the mean scores that rural male students with right hemisphericity had significantly lower academic achievement than that of rural female students with left hemisphericity.

It was concluded that there was significant difference between academic achievement of rural female students with right hemisphericity and urban female students with left hemisphericity. The rural female students with right hemisphericity had significantly poor academic achievement as compared to urban female students with left hemisphericity.
It was revealed that there was no significant difference between academic achievement of rural female students with right hemisphericity and rural male students with left hemisphericity.

It was inferred that there was significant difference between academic achievement of rural female students with right hemisphericity and rural female students with left hemisphericity. The rural female students with right hemisphericity had significantly lower academic achievement than rural female students with left hemisphericity.

From the results, it was found that there was no significant difference between academic achievement of urban male students with left hemisphericity and urban female students with left hemisphericity.

6.20.3 FINDINGS RELATED TO EFFECT OF META-COGNITIVE SKILLS, LOCALITY AND GENDER ON STUDY HABITS OF SCHOOL STUDENTS

15) Main Effects of Meta-cognitive Skills, Locality and Gender on Study Habits of School students

A significant effect of meta-cognitive skills on study habits of school students was found that led to the inference that students with high meta-cognitive skills possessed significantly better study habits as compared to students with low meta-cognitive skills.

There was found a significant effect of locality on study habits of school students. In the context of mean scores, it was concluded that urban students had significantly good study habits than rural students.

The study revealed that there was no significant effect of gender on study habits of school students leading to the conclusion that male and female students did not differ significantly with respect to their study habits.

16) Double Interaction Effects of Meta-cognitive Skills, Locality and Gender on Study Habits of School students

Meta-cognitive Skills (A) × Locality (C)
There was found a significant interaction effect of meta-cognitive skills and locality on study habits of school students. The result of t-test further explored that:

- It can be concluded from the results that there was significant difference between study habits of urban students with high meta-cognitive skills and urban students with low meta-cognitive skills. Urban students with high meta-cognitive skills had significantly good study habits as compared to urban students with low meta-cognitive skills.

- A significant difference was found between the study habits of rural students with high meta-cognitive skills and rural students with low meta-cognitive skills. Rural students with high meta-cognitive skills had significantly better study habits than that of rural students with low meta-cognitive skills.

- In the context of mean scores, it was observed that there was significant difference between study habits of urban students with high meta-cognitive skills and rural students with low meta-cognitive skills. Urban students with high meta-cognitive skills had significantly good study habits than rural students with low meta-cognitive skills.

- No significant difference was found between study habits of rural students with high meta-cognitive skills and urban students with low meta-cognitive skills.

- Form the comparison of mean scores, it was further concluded that urban students with high meta-cognitive skills had significantly good study habits than rural students with high meta-cognitive skills.

- From the results, it was revealed that there was no significant difference between study habits of urban students with low meta-cognitive skills and rural students with low meta-cognitive skills.

**Meta-cognitive Skills (A) × Gender (D)**

It was found that meta-cognitive skills and gender differed significantly with each other in relation to study habits of school students. The result of t-test further concluded that:
It was concluded that male students having high level of meta-cognitive skills possessed significantly good study habits than that of male students having low level of meta-cognitive skills.

A significant difference was observed between study habits of female students having high and low level of meta-cognitive skills. It was concluded that female students with high meta-cognitive skills had significantly good study habits as compared to female students with low meta-cognitive skills.

On comparison of mean scores, a significant difference was found between study habits of male students having high level of meta-cognitive skills and female students having low level of meta-cognitive skills. The former had significantly good study habits than that of the later one.

It was concluded that there was significant difference between study habits of female students having high level of meta-cognitive skills and male students having low level of meta-cognitive skills. From the comparison of mean scores, it was deduced that female students with high meta-cognitive skills had significantly better study habits than male students with low meta-cognitive skills.

Male students having high level of meta-cognitive skills had poor study habits than that of female students having high level of meta-cognitive skills.

It was deduced from the results of the study, that there was no significant difference between study habits of male and female students having low level of meta-cognitive skills.

Locality (A) × Gender (B)

It was revealed that locality and gender do not interact significantly with each other in relation to study habits of school students.

17) Triple Interaction Effect of Meta-cognitive Skills, Locality and Gender on Study Habits of School students

It was concluded that there was no significant interaction effect of meta-cognitive skills, locality and gender on study habits of school students.
6.20.4 FINDINGS RELATED TO EFFECT OF LEARNING & THINKING STYLE, LOCALITY AND GENDER ON STUDY HABITS OF SCHOOL STUDENTS

A. Main Effects of Learning & Thinking Style, Locality and Gender on Study Habits of School students

- It can be concluded from the results that learning & thinking style had a significant effect on study habits of school students. Further it was inferred that students learned by right hemisphere had significantly good study habits in comparison to students learned by left hemisphere.
- Locality was found to have a significant effect on study habits of school students. On the comparison of mean scores, it was revealed that urban students possessed significantly better study habits than that of rural students.
- There was found a significant effect of gender on study habits of school students. In terms of mean score, it was observed that male students had significantly good study habits in comparison to female students.

B. Double Interaction Effects of Learning & Thinking Style, Locality and Gender on Study Habits of School students

Learning & Thinking Style (B) × Locality (C)

It was inferred that there was no significant interaction effect of learning & thinking style and locality on study habits of school students.

Learning & Thinking Style (B) × Gender (D)

The results of the study revealed that learning & thinking style and gender differed significantly with each other in relation to study habits of school students. The result of t-test further inferred that:

- It can be concluded from the results that there was no significant difference between study habits of male students with right hemisphericity and left hemisphericity.
By comparing mean scores, it was revealed that female students with right hemisphericity had significantly better study habits than female students with left hemisphericity.

It was found that male students with right hemisphericity had significantly good study habits as compared to female students with left hemisphericity.

No significant difference was observed between study habits of female students with right hemisphericity and male students with left hemisphericity.

It was revealed that there was significant difference between study habits of male and female students with right hemisphericity. Male students with right hemisphericity had significantly poor study habits than female students with right hemisphericity.

The result of study further revealed that male students with left hemisphericity had significantly better study habits than female students with left hemisphericity.

**Locality (C) × Gender (D)**

It was evident from the results of the study that there was significant interaction effect of locality and gender on study habits of school students. The result of t-test further revealed that:

- It was concluded from the results that there was a slightly difference between study habits of urban and rural male students. Urban male students had slightly better study habits than rural male students.

- In the context of mean scores, it was revealed that urban female students had significantly good study habits as compared to rural female students.

- It was evident from the results of the study that urban male students had significantly good study habits than rural female students.

- It was inferred from the results that there was no significant difference between study habits of urban female students and rural male students.

- No significant difference was found between the study habits of urban male students and urban female students.
From the result of the study, it was further inferred that rural male students had significantly good study habits than rural female students.

C. Triple Interaction Effect of Learning & Thinking Style, Locality and Gender on Study Habits of School students

There was found a significant interaction effect of learning & thinking style, locality and gender on study habits of school students. The result of t-test further explored that:

- From the comparison of mean scores, it was found that there was significant difference between study habits of urban male students with right hemisphericity and rural female students with left hemisphericity. It was concluded that urban male students with right hemisphericity possessed significantly good study habits as compared to rural female students with left hemisphericity.

- There was found a significant difference between study habits of urban female students with right hemisphericity and rural male students with left hemisphericity. Urban female students with right hemisphericity had significantly good study habits as compared to rural male students with left hemisphericity.

- In the context of mean scores, it was revealed that rural female students with right hemisphericity had poor study habits than urban male students with left hemisphericity.

- It was deduced that there was a significant difference in study habits of rural male students with right hemisphericity and urban female students with left hemisphericity. Further, it was concluded that rural male students with right hemisphericity possessed significantly better study habits than urban female students with left hemisphericity.

- A significant difference was found between study habits of urban male students with right hemisphericity and urban female students with right hemisphericity. From the results, it was revealed that urban male students with right hemisphericity had significantly poor study habits in comparison to urban female students with right hemisphericity.

- There was found no significant difference between study habits of urban male students with right hemisphericity and rural male students with right hemisphericity.
From the comparison of mean scores, it was revealed that urban male students with right hemisphericity had significantly good study habits than the rural female students with right hemisphericity.

It was concluded from the analysis of mean scores that urban female students with right hemisphericity had significantly good study habits as compared to the rural male students with right hemisphericity.

There was found a significant difference between study habits of urban female students with right hemisphericity and rural female students with right hemisphericity. Urban female students with right hemisphericity had significantly good study habits than rural female students with right hemisphericity.

A significant difference was found between study habits of rural female students with left hemisphericity and rural male students with left hemisphericity. From the comparison of mean scores, it was concluded that rural female students with left hemisphericity had significantly poor study habits than that of rural male students with left hemisphericity.

No significant difference was found between study habits of rural female students with left hemisphericity and urban female students with left hemisphericity.

It was revealed from the comparison of mean scores that there was significant difference between study habits of rural female students with left hemisphericity and urban male students with left hemisphericity. Rural female students with left hemisphericity possessed significantly poor study habits in comparison to urban male students with left hemisphericity.

A significant difference was found between study habits of rural male students with left hemisphericity and urban female students with left hemisphericity. From the comparison of mean scores, it was further revealed that the former had significantly better study habits than that of the later one.

From the results, it was revealed that there existed a significant difference between study habits of rural male students with left hemisphericity and urban male students with left hemisphericity. From the mean scores, it was concluded that rural male
students with left hemisphericity had significantly poor study habits as compared to urban male students with left hemisphericity.

- It was inferred that there was significant difference between study habits of urban male students with right hemisphericity and urban male students with left hemisphericity. From the comparison of mean scores, it was concluded that former had significantly poor study habits than that of the later one.

- A significant difference was found between study habits of urban male students with right hemisphericity and urban male students with left hemisphericity. Urban male students with right hemisphericity possessed significantly good study habits than urban female students with left hemisphericity.

- It was concluded that there was no significant difference between study habits of urban male students with right hemisphericity and rural male students with left hemisphericity.

- There was significant difference between study habits of urban female students with right hemisphericity and urban male students with left hemisphericity. It was concluded that former had significantly good study habits as compared to the later one.

- It was revealed that there was significant difference between study habits of urban female students with right hemisphericity and urban female students with left hemisphericity. Urban female students with right hemisphericity had significantly good study habits than urban female students with left hemisphericity.

- A significant difference was found between study habits of urban female students with right hemisphericity and rural female students with left hemisphericity. Further, it was observed that urban female students with right hemisphericity possessed significantly good study habits as compared to rural female students with left hemisphericity.

- By comparing mean scores, it was deduced that rural male students with right hemisphericity had significantly good study habits than that of the rural female students with right hemisphericity.
It was found that there was significant difference between study habits of rural male students with right hemisphericity and urban male students with left hemisphericity. Rural male students with right hemisphericity had significantly poor study habits in comparison to urban male students with left hemisphericity.

It was observed that there was no significant difference between study habits of rural male students with right hemisphericity and rural male students with left hemisphericity.

It was revealed that there was significant difference between study habits of rural male students with right hemisphericity and rural female students with left hemisphericity. It was concluded from the mean scores that rural male students with right hemisphericity had significantly better study habits than that of rural female students with left hemisphericity.

A significant difference was found between study habits of rural female students with right hemisphericity and urban female students with left hemisphericity. The rural female students with right hemisphericity had significantly good study habits as compared to urban female students with left hemisphericity.

There was found no significant difference between study habits of rural female students with right hemisphericity and rural male students with left hemisphericity.

From the results, it was revealed that there was significant difference between study habits of rural female students with right hemisphericity and rural female students with left hemisphericity. The rural female students with right hemisphericity possessed significantly good study habits as compared to rural female students with left hemisphericity.

It was concluded from the results of the study that there was significant difference between study habits of urban male students with left hemisphericity and urban female students with left hemisphericity. It was further observed that urban male students with left hemisphericity had significantly good study habits than urban female students with left hemisphericity.

6.20.5 FINDINGS RELATED TO PREDICTION OF ACADEMIC ACHIEVEMENT AMONG SCHOOL STUDENTS ON THE BASIS OF
THEIR META-COGNITIVE SKILLS AND LEARNING & THINKING STYLE

- From the results of the study, it was explored that both the variables i.e. meta-cognitive skills and learning & thinking style were significantly contributing towards prediction of academic achievement of school students. From the comparison of t-values, it was concluded that the variable meta-cognitive skills was the strongest predictor of academic achievement of school students in comparison to learning & thinking style.

6.20.6 FINDINGS RELATED TO PREDICTION OF STUDY HABITS AMONG SCHOOL STUDENTS ON THE BASIS OF THEIR META-COGNITIVE SKILLS AND LEARNING & THINKING STYLE

- It was observed from the computation of the data that both the variables i.e. meta-cognitive skills and learning & thinking style were significantly contributing towards prediction of study habits among school students. Further, it was inferred from the comparison of t-values that the variable learning & thinking style was the strongest predictor of study habits among school students in comparison to meta-cognitive skills.

6.21 CONCLUSION

Writing conclusion is an imperative part of the research process as it represents everything together. The present investigation aimed to study academic achievement and study habits among school students in relation to their meta-cognitive skills and learning & thinking style. At the outset, the effect of meta-cognitive skills, locality and gender was examined on academic achievement of school students. All the three variables (Meta-cognitive Skills, Locality and Gender) were reported to have significant main effect on academic achievement of school students. The study revealed significant double interaction effects of meta-cognitive skills and locality; locality and gender on academic achievement of school students whereas the double interaction effect of meta-cognitive skills and gender was found insignificant. However, the triple interaction effect of meta-cognitive skills, locality and gender was found to be significant.
On exploring the effect of learning & thinking style, locality and gender on academic achievement of school students, it was found that learning & thinking style, locality and gender had a significant main effect on academic achievement and it was observed that the urban & rural, male & female students having right hemisphericity and left hemisphericity differed significantly with respect to their academic achievement. In the context of double interaction effect, it was revealed that there was significant interaction effects of learning & thinking style and locality; learning & thinking style and gender on academic achievement of school students. However, the study reported that locality and gender had no significant interaction effect on academic achievement of school students. The study also concluded that there was a significant triple interaction effect of the variables i.e. learning & thinking style, locality and gender on academic achievement of school students.

The third section focused on the effect of meta-cognitive skills, locality and gender was examined on study habits of school students. The findings revealed significant main effects of meta-cognitive skills and locality on study habits of school students whereas no significant difference was observed between study habits of male and female school students. The double interaction effects of meta-cognitive skills & locality and meta-cognitive skills and gender on study habits of school students were found to be significant leading to the inference that these variables interact with each other to have an effect on study habits. However, the double interaction effect of locality and gender was not found significant leading to the conclusion that locality and gender did not interact significantly with each other in relation to study habits. Similarly, the interaction effect of all the three variables namely meta-cognitive skills, locality and gender on study habits of school students was also reported to be insignificant.

The fourth section dealt with the effect of learning & thinking style, locality and gender on study habits of school students, it was found that learning & thinking style, locality and gender had a significant main effect on study habits and it was observed that the urban & rural, male & female students having right hemisphericity and left hemisphericity differed significantly with respect to their study habits. In the context of double interaction effects, it was revealed that there were significant double interaction
effects of learning & thinking style and gender; locality and gender on study habits of school students. However, the study reported that learning & thinking style and locality had no significant interaction effect on study habits of school students. The study also reported that there was a significant triple interaction effect of learning & thinking style, locality and gender on study habits of school students.

Lastly, in the prediction phase, both the variables i.e. meta-cognitive skills and learning & thinking style came into the limelight while concluding the results. In case of academic achievement, the variable, meta-cognitive skills was found to be the strongest predictor than learning & thinking style whereas in the context of study habits, the variable, learning & thinking style was found to be the strongest predictor. In the end, it was concluded that these variables (meta-cognitive skills and learning & thinking style) were significantly contributing towards prediction of academic achievement and study habits of school students.

6.22 EDUCATIONAL IMPLICATIONS
The most outstanding characteristic of any research is that it contributes something new towards the development of the area concerned. The findings of the present study raised some significant issues that are beneficial for educational thinkers, psychologists, teachers and others who are concerned with the sphere of education. The present study lays emphasis on the improvement of strategies for the transmission of knowledge in school students. The present study has a wide range of implementation in the field of education. The present study showed that students with high meta-cognitive skills possessed higher academic achievement than that of students with low meta-cognitive skills. It may be due to the fact that students having high meta-cognitive skills are more self-regulated learners and are cognizant of their academic strengths & weaknesses and have a repertoire of strategies they apply to tackle the day to day challenges of their academic tasks. In order to improve the academic achievement of students with low meta-cognitive skills, constructivist way of learning should be encouraged among students to develop their meta-cognitive skills. Instead of only memorizing, how to learn skill should be inculcated in students. They should be encouraged to be active
participants of their own learning by having their learning controlled. Meta-cognitive skills among students can be enhanced in co-operative problem solving by discussing possible approaches with their friends and learning from each other. Teacher training programmes should include meta-cognitive learning and self-regulated learning strategies which enable the teachers to teach effectively. The more emphasize on development of meta-cognitive skills in the school curriculum is considered important because of its impact in improving academic performance of students.

It was revealed that students learned by left hemisphere had slightly higher academic achievement in comparison to students learned by right hemisphere. It is considered that no one is totally left-brained or right-brained however, probably everyone has a dominant side of the brain. Left brained children have analytical thinking. They always want to know the rules and follow them. They take in information through analysis, observation and thinking. Their language abilities are so refined and also good at processing symbols and mathematical formulas. Right brained ones use mostly their feelings about something to decide if it is true or not. Their minds move rapidly from one thought to another and this causes difficulties in finishing their assignments. They are holistic, creative, imaginative & visual learners and singing, music, art, writing, designing, anything based on creativity are easy for them. They view their opinions through their own personal experiences and backgrounds.

The reason responsible for poor academic achievement of right brained school students may be the left-brain strategies which are most often used in classrooms by left brained teachers, who themselves love order, sequence and planning which results in their academic achievement. Right brained learners do not always get the rewards or understanding of a different way to process information and feel inadequate. To solve this problem teacher should find out the dominant part of their students’ brains and use the appropriate classroom techniques, methods and tools according to them only then better and greater learning can be accomplished. Discussions may be arranged on general problems, world affairs from the reading of daily newspapers and magazines. Games based on verbal materials, numerical, events and meditation can be encouraged after class hours.
Academic achievement of urban students was found significantly higher than that of rural students. The reason for higher academic achievement of urban students may be more qualified teachers, more learning facilities, infrastructure and other facilities i.e. electricity, water supply etc. Urban schools environment enriched with modern facilities makes the student feel comfortable in their studies that results to high academic performance. The uneven distribution of resources, poor school mapping, facilities, problem of qualified teachers, refusing appointment or not willing to perform well in isolated villages, lack of good transport facility, poor communication, and nonchalant attitude of some communities towards schools are some of the factors contributed to a wide gap between academic achievement of urban and rural schools students. In order to bridge this gap of uneven academic achievement between urban and rural schools students there should be the inclusion of proper school buildings, classroom, accommodation, libraries, laboratories, furniture, recreational equipment, apparatus and other instructional materials in rural schools. The availability, relevance and adequacy of these facilities will contribute towards their academic achievement. When students in high-poverty rural schools have greater access to new technologies and more experienced teachers who know how to use technologies, only then academic performance of students can increase.

The result of the study indicated that female students had better academic achievement than that of male students. The reasons proposed are both biological and environmental. The fact is that female students are more active, resourceful and sincere in their efforts whereas these characteristics are lagging among male students. Male students are classified as emotionally more disturbed than female students. Male students also display a greater amount of negative social behavior than female students in the classroom and this is thought to play a role in their academic performance. This type of problem may be resolved by arranging counseling session for students that in progress of a school there is a single role of student, not male student and female student. Parents and educators should encourage and support all students to do their best in school regardless of their sex. Hopefully, the environment of schools, that can encourage both male and female students to try to succeed in school and to stay in school, should be
developed. Educational planners, administrators and evaluators should supervise, monitor and co-ordinate the activities of schools which decrease gender biasness.

The present study explored that students having high meta-cognitive skills possessed significantly better study habits than students having low meta-cognitive skills. The fact is that students with high meta-cognitive skills are more aware towards their learning. They prepare a time table and follow it during their learning. They make handmade notes of difficult topics with concentration and underline confusing words while reading. They are also aware of the strategies when, why and how a particular strategy is to be adopted. But this ability lacks in students with low meta-cognitive skills. Students’ ability to monitor their learning is one of the key building blocks in self-regulated learning. Therefore, students should aware of their level of mastery of learning material and also adjust their study time and strategies. Teachers should allocate time for teaching learning strategies & reflective thinking activities and they should also encourage students to read books. Teaching learning strategies can be said to develop students’ meta-cognitive skills. In the school, teachers should recognize the influence of student habits on learning outcome with a view of monitoring and determining individual student learning problem for appropriate action.

In the present study it was found that right hemisphere preferred students had better study habits in comparison to left hemisphere preferred students. The fact is that right hemisphere preferred students put study information into categories for better understanding. They use their abilities to know whether something is right or wrong. In the classroom, they don’t mess by thinking of all possibilities in answering questions. Thus, to solve this problem teacher should screened students for level of study habits in the beginning according to their hemisphere dominance. If they are low in the domain, teachers in concurrence with the guidance counselors can work with such students to promote and enhance their study habits. Teachers should plan their teaching accordingly by adopting effective teaching methods, proper teaching strategies and by guiding students in view of their study habits. Left brained students should organize their study notes properly and study alone because they get frustrated with others. They should not too argue with class teacher and avoid free thinking teachers if they confuse them.
From the results it was inferred that urban students had good study habits in comparison to rural students. The reasons responsible for this may be the family background of students, lack of functional libraries in schools, lack of trained teachers, the failure to provide library periods in schools, shortage of equipment and resources for better study skills etc. The results of the study have implications for curriculum planners as well as teachers in order to give due emphasis in developing study habits among school students. Hence, to improve the study habits of rural students, teachers should motivate them to study during leisure time, reading newspaper, participation in classroom discussion and answer the questions in the classroom frequently. The teachers should also conduct weekly, monthly reading tests, oral tests and written tests by making a fair assessment of the students that could be of great value in the evaluation of study habits of students. Organized and having homework routines are the most important things in helping a student to develop better study habits for life.

It was found that male students had better study habits than female students. The reason behind this may be that female students have more cramming power in comparison to male students as they learn anything in a logical manner. Female students are failure to inform their teachers of their difficulties with school work and don’t ask for their help. Male students prefer to study alone and also display greater confidence in their study skills as compared to female students. Teacher characteristics and the classroom environment also have been identified as contributors to this gender gap. Unfortunately, many females report being passed over in classroom discussions, not encouraged by the teacher, and made to feel stupid. Therefore counseling strategies should be adopted to assist the female students to improve on their study habits. Classroom environments can be made to feel more ‘girl-friendly’ by incorporating female role models and same-sex cooperative learning communities. Parents should always check their female wards at home to ensure that they study properly in a logical manner or not and also provide them study essentials such as textbooks, notes, pen, pencil etc.

6.23 SUGGESTIONS FOR FURTHER RESEARCH

Academic achievement and study habits are the central concept in the area of education. Therefore, immense importance is placed on academic achievement & study habits and
the factors involved therein. The present study has thrown some light and insight to study academic achievement and study habits of school students in relation to their meta-cognitive skills, learning & thinking style.

This research is not perfect and complete in its all aspects because every research has got its own limitations. Due to paucity of time and resources at the disposal of the investigator, all the aspects of the problem cannot be expected to deal with. Therefore, the present study opens up certain avenues for further research which are briefly mentioned below:

- Similar study can be conducted on a larger sample as the present study was conducted on a sample of 500 school students.
- The present piece of research was confined to study the academic achievement of students in all subjects of their study. It would surely be useful to study the achievement of students in a particular subject also.
- In the present study, the sample was delimited only to Haryana state. It can also be extended to other states also.
- The sample of present study was delimited to schools affiliated to Central Board of Secondary Education. It can be extended to other Board of Education also.
- The present study was conducted on a sample of secondary school students only. It can be extended to senior secondary and undergraduate college students and comparison can be made between them.
- The present study was delimited to the sample of 9th class students. The similar study can be conducted on other standard also.
- The present study was carried out in only Jind and Rohtak districts of Haryana state. It can be extended to other districts also.
- Only two demographic variables viz. locality and gender have been taken up in the present study. The other demographic variables such as type of school, academic stream, socio-economic status etc. can also be taken up.
- Apart from meta-cognitive skills, and learning & thinking style, other variables like intelligence, creativity, mental health, emotional intelligence, school environment
etc. which affects academic achievement and study habits can be explored in further research.
The list which has been given above is, however, not exhaustive but illustrative. There are vast areas in this field which have not been explored so far and any attempt in this direction may both be rewarding and instructive. If the present study is able to provide thinking in this direction, the efforts of the investigator would be amply rewarded.